

# Specifications



Photo is representative



## Eaton 197166

Eaton Moeller® series EMS2 DOL starter, 24 V DC, 1,5 - 7 (AC-53a), 9 (AC-51) A, Screw terminals, Controlled stop, PTB 19 ATEX 3000

### General specifications

<b>PRODUCT NAME</b>	Eaton Moeller® series EMS2 DOL starter
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<b>CATALOG NUMBER</b>	197166
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<b>MODEL CODE</b>	EMS2-DOS-Z-9-24VDC
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<b>EAN</b>	4015080896074
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<b>PRODUCT LENGTH/DEPTH</b>	114.5 mm
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<b>PRODUCT HEIGHT</b>	99 mm
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<b>PRODUCT WIDTH</b>	22.5 mm
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<b>PRODUCT WEIGHT</b>	0.287 kg
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### CERTIFICATIONS

IEC/EN 60947-4-2  
IEC 61508  
EN ISO 13849  
UL508  
UL File No.: E338590  
UL Category Control No.: NLDX, NLDX7  
PTB 19 ATEX 3000  
UL 60947-4-1  
CSA-C22.2 No. 60947-4-1-14  
CE marking  
UL listed  
Certified by UL for use in Canada  
UL report applies to both US and Canada

## Features & Functions

<b>FUNCTIONS</b>	Temperature
	compensated overload
	protection
	Motor protection
	Controlled stop
	DOL starting

## General

<b>CLASS</b>	CLASS 10 A
<b>CONNECTION TO SMARTWIRE-DT</b>	No
<b>DEGREE OF PROTECTION</b>	IP20 NEMA Other
<b>MODEL</b>	Direct starter
<b>MOUNTING METHOD</b>	Rail mounting possible Top-hat rail fixing (according to IEC/EN 60715, 35 mm)
<b>MOUNTING POSITION</b>	Vertical Motor feeder at bottom
<b>OVERLOAD RELEASE CURRENT SETTING - MIN</b>	1.5 A
<b>OVERLOAD RELEASE CURRENT SETTING - MAX</b>	9 A
<b>PRODUCT CATEGORY</b>	Electronic motor starter
<b>RESIDUAL RIPPLE</b>	≤ 5 % (input voltage)
<b>TERMINAL CAPACITY</b>	0.2 - 2.5 mm <sup>2</sup> , Main cables 0.14 - 2.5 mm <sup>2</sup> , Control circuit cables 0.2 - 2.5 mm <sup>2</sup> , Main cables, Push-in terminals
<b>TERMINAL CAPACITY (AWG)</b>	26 - 14, Control circuit cables 24 - 14, Main cables
<b>TYPE</b>	DOL starter (complete device)
<b>VOLTAGE TYPE</b>	DC

## Climatic environmental conditions

<b>AMBIENT OPERATING TEMPERATURE - MIN</b>	-25 °C
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<b>AMBIENT OPERATING TEMPERATURE - MAX</b>	70 °C
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<b>AMBIENT STORAGE TEMPERATURE - MIN</b>	40 °C
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<b>AMBIENT STORAGE TEMPERATURE - MAX</b>	80 °C
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## Electro magnetic compatibility

<b>RADIO INTERFERENCE CLASS</b>	Class A (EN 61000-6-3, emitted interference, radiated) EN 55011
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## Electrical rating

<b>RATED ACTUATING CURRENT (IC)</b>	5 mA
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<b>RATED CONDITIONAL SHORT-CIRCUIT CURRENT (IQ), TYPE 2, 380 V, 400 V, 415 V</b>	0 A
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<b>RATED CONTROL SUPPLY CURRENT IS</b>	40 mA
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<b>RATED CONTROL SUPPLY VOLTAGE</b>	19.2 - 30 V DC
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<b>RATED CONTROL VOLTAGE (UC)</b>	24 V (Actuating circuit ON, L, R)
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<b>RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MIN</b>	0 V
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<b>RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MAX</b>	0 V
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<b>RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MIN</b>	0 V
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<b>RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MAX</b>	0 V
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<b>RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MIN</b>	24 V
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<b>RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MAX</b>	24 V
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<b>RATED OPERATIONAL CURRENT (IE)</b>	9 A
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<b>RATED OPERATIONAL CURRENT (IE) AT AC-15, 220 V, 230 V, 240 V</b>	2 A
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<b>RATED OPERATIONAL CURRENT (IE) AT AC-3, 380 V, 400 V, 415 V</b>	7 A
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<b>RATED OPERATIONAL CURRENT (IE) AT AC-51</b>	9 A
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<b>RATED OPERATIONAL CURRENT (IE) AT AC-53A - MAX</b>	7 A
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<b>RATED OPERATIONAL CURRENT (IE) AT DC-13, 24 V</b>	2 A
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<b>RATED OPERATIONAL POWER AT AC-3, 220/230</b>	1.5 kW
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## Contacts

<b>NUMBER OF AUXILIARY CONTACTS (NORMALLY CLOSED CONTACTS)</b>	1
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<b>NUMBER OF AUXILIARY CONTACTS (NORMALLY OPEN CONTACTS)</b>	1
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<b>NUMBER OF CONTACTS (CHANGE-OVER CONTACTS)</b>	1
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<b>V, 50 HZ</b>	
<b>RATED OPERATIONAL POWER AT AC-3, 380/400 V, 50 HZ</b>	3 kW
<b>RATED OPERATIONAL POWER AT AC-53A, 380/400 V, 50 HZ</b>	3 kW
<b>RATED OPERATIONAL VOLTAGE</b>	500 V AC 42 - 550 V
<b>SWITCHING LEVEL</b>	-3 - 9.6 V DC, Switching level "Low", Actuating circuit (ON, L, R) 19.2 - 30 V DC, Switching level "High", Actuating circuit (ON, L, R) < 5 V DC, Switching level "confirm Off", Actuating circuit (ON, L, R)

Safety	
<b>EXPLOSION SAFETY CATEGORY FOR DUST</b>	ATEX dust-ex-protection, II (2) D [Ex t] [Ex p] ATEX dust-ex-protection, II (2) G [Ex e] [Ex d] [Ex px]
<b>SAFETY PARAMETER (EN ISO 13849-1)</b>	PL e, Performance level (safe switch off) 3 (safe switch off), Category 60 (safe switch off) / 70 (motor protection) years; MTTFD
<b>SAFETY PARAMETER (IEC 62061)</b>	99 %, SFF 99 % (safe switch off) / 98 % (motor protection), DC SIL 3 (Safe switch off) / SIL 2 (Motor protection) Opening delay [ms]: 200 (safe switch off) / Class 10A (motor protection) PFHd [FIT]: 2.3 (Safe switch off) λsd [FIT]: 0 λsu [FIT]: 1072 (Safe switch off) / 969 (Motor protection) λdu [FIT]: 2.3 (Safe switch off) / 11 (Motor protection)  λdd [FIT]: 580 (Safe switch off) / 601 (Motor protection)

Design verification	
<b>EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID</b>	12 W
<b>HEAT DISSIPATION CAPACITY PDISS</b>	0 W
<b>HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID</b>	0 W
<b>RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)</b>	9 A
<b>STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS</b>	2 W
<b>HEAT DISSIPATION DETAILS</b>	If necessary, Allow for derating
<b>10.2.2 CORROSION RESISTANCE</b>	Meets the product standard's requirements.
<b>10.2.3.1 VERIFICATION OF THERMAL STABILITY OF ENCLOSURES</b>	Meets the product standard's requirements.
<b>10.2.3.2 VERIFICATION OF RESISTANCE OF INSULATING MATERIALS TO NORMAL HEAT</b>	Meets the product standard's requirements.
<b>10.2.3.3 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE</b>	Meets the product standard's requirements.

<b>BY INTERNAL ELECT. EFFECTS</b>	
<b>10.2.4 RESISTANCE TO ULTRA-VIOLET (UV) RADIATION</b>	Meets the product standard's requirements.
<b>10.2.5 LIFTING</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.2.6 MECHANICAL IMPACT</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.2.7 INSCRIPTIONS</b>	Meets the product standard's requirements.
<b>10.3 DEGREE OF PROTECTION OF ASSEMBLIES</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.4 CLEARANCES AND CREEPAGE DISTANCES</b>	Meets the product standard's requirements.
<b>10.5 PROTECTION AGAINST ELECTRIC SHOCK</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.6 INCORPORATION OF SWITCHING DEVICES AND COMPONENTS</b>	Does not apply, since the entire switchgear needs to be evaluated.
<b>10.7 INTERNAL ELECTRICAL CIRCUITS AND CONNECTIONS</b>	Is the panel builder's responsibility.
<b>10.8 CONNECTIONS FOR EXTERNAL CONDUCTORS</b>	Is the panel builder's responsibility.
<b>10.9.2 POWER-FREQUENCY ELECTRIC STRENGTH</b>	Is the panel builder's responsibility.
<b>10.9.3 IMPULSE WITHSTAND VOLTAGE</b>	Is the panel builder's responsibility.
<b>10.9.4 TESTING OF ENCLOSURES MADE OF INSULATING MATERIAL</b>	Is the panel builder's responsibility.
<b>10.10 TEMPERATURE RISE</b>	The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.
<b>10.11 SHORT-CIRCUIT RATING</b>	Is the panel builder's responsibility. The specifications for the switchgear must be observed.
<b>10.12 ELECTROMAGNETIC COMPATIBILITY</b>	Is the panel builder's responsibility. The

	specifications for the switchgear must be observed.
<b>10.13 MECHANICAL FUNCTION</b>	The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

## Resources

<b>APPLICATION NOTES</b>	<a href="#">eaton-motor-starter-ems2-setting-motor-protection-twincat3-ap034001-en-us.pdf</a>
<b>BROCHURES</b>	<a href="#">eaton-ems2-electronic-motorstarter-brochure-br034001en-en-us.pdf</a>
<b>CHARACTERISTIC CURVE</b>	<a href="#">eaton-contactors-ems2-reversing-starter-characteristic-curve.eps</a>
	<a href="#">eaton-contactors-ems2-reversing-starter-characteristic-curve-004.eps</a>
	<a href="#">eaton-contactors-ems2-reversing-starter-characteristic-curve-002.eps</a>
<b>DECLARATIONS OF CONFORMITY</b>	<a href="#">DA-DC-00004947.pdf</a> <a href="#">DA-DC-00004126.pdf</a> <a href="#">DA-DC-00004948.pdf</a>
<b>DRAWINGS</b>	<a href="#">eaton-contactors-ems2-reversing-starter-dimensions-002.eps</a> <a href="#">eaton-contactors-ems2-reversing-starter-3d-drawing-002.eps</a>
<b>ECAD MODEL</b>	<a href="#">DA-CE-ETN.EMS2-DOS-Z-9-24VDC</a>
<b>INSTALLATION INSTRUCTIONS</b>	<a href="#">IL034089ZU</a>
<b>INSTALLATION VIDEOS</b>	<a href="#">Eaton's electronic motor starter EMS2</a>
<b>MANUALS AND USER GUIDES</b>	<a href="#">eaton-electronic-motor-starter-ems2-manual-mn034003en-us.pdf</a>
<b>MCAD MODEL</b>	<a href="#">DA-CD-ems2 dos ros z 24 230v</a> <a href="#">DA-CS-ems2 dos ros z 24 230v</a>
<b>SALES NOTES</b>	<a href="#">eaton-ems2-electronic-motorstarter-flyer-fl034007en-en-us.pdf</a>

PROJECT NAME:
PROJECT NUMBER:
PREPARED BY:
DATE:



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